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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Air Force **Date:** May 2017

Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0604602F I Armament/Ordnance Development							
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	36.266	20.312	46.540	0.000	46.540	75.547	36.644	205.043	117.144	Continuing	Continuing
651033: Sensor Fuzed Weapon	-	0.000	0.000	32.092	0.000	32.092	41.016	8.004	0.000	0.000	Continuing	Continuing
653133: Bombs & Fuzes	-	17.546	11.066	9.592	0.000	9.592	29.596	23.614	199.930	111.926	Continuing	Continuing
653134: BLU-109 and BLU-113 Upgrade	-	13.412	4.496	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	17.908
655361: Stores-Aircraft Interface	-	5.308	4.750	4.856	0.000	4.856	4.935	5.026	5.113	5.218	Continuing	Continuing

Note

This program, BA 05 PE 0604602F, project 651033, Sensor Fuzed Weapon-Extended Range (SFW-ER), is a new start.

This program, BA 05 PE 0604602F, project 653133, Cockpit-Selectable Height-Of-Burst Sensor (C-HOBS), is a new start.

A. Mission Description and Budget Item Justification

The Armament/Ordnance Development program provides for the development and integration of advanced precision, navigation, and timing (PNT) capabilities (i.e., GPS, non-GPS, optical, passive, active, etc.); initial and continuing development of weapons, munitions, and munitions equipment for aircraft integration, support, and operational use. This program develops, characterizes, and improves current, future, and legacy munitions, ammunitions, and subsystems.

The Armament/Ordnance Development program is a collection of efforts in Budget Activity 5, System Development and Demonstration (SDD). The program efforts are conducting TMRR and EMD tasks aimed at meeting validated requirements prior to full-rate production, to include pre-planned product improvements (P3I).

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	37.654	20.312	6.551	0.000	6.551
Current President's Budget	36.266	20.312	46.540	0.000	46.540
Total Adjustments	-1.388	0.000	39.989	0.000	39.989
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-1.388	0.000			
• Other Adjustments	0.000	0.000	39.989	0.000	39.989

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Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604602F / Armament/Ordnance Development	
<div>Change Summary Explanation</div> <div>FY2018 increase of \$8.500M is for development of C-HOBS</div> <div>FY2018 increase of \$32.092M for Sensor Fuze Weapon</div> <div>FY2018 decrease of \$0.645M ZBT to PE 0604327F, BPAC 645341, PEC Hard and Deeply Buried Target Defeat System (HDBTDS) Program</div>		

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600 / 5					R-1 Program Element (Number/Name) PE 0604602F / Armament/Ordnance Development				Project (Number/Name) 651033 / Sensor Fuzed Weapon			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
651033: Sensor Fuzed Weapon	-	0.000	0.000	32.092	0.000	32.092	41.016	8.004	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note This program, BA 05 PE 0604602F, project 651033, Sensor Fuzed Weapon-Extended Range (SFW-ER), is a new start.												
A. Mission Description and Budget Item Justification Modification to develop a wing kit to extend the range of inventory Cluster Bomb Unit-105 (CBU-105) anti-tank area attack weapons.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Sensor Fuzed Weapon-Extended Range (SFW-ER)								0.000	0.000	32.092	0.000	32.092
Description: Modification to develop a wing kit to extend the range of inventory Cluster Bomb Unit-105 (CBU-105) anti-tank area attack weapons.												
FY 2016 Accomplishments: N/A												
FY 2017 Plans: N/A												
FY 2018 Base Plans: Develop modification to wing kit to extend the range of inventory Cluster Bomb Unit-105 (CBU-105) anti-tank area attack weapons.												
FY 2018 OCO Plans: N/A												
Accomplishments/Planned Programs Subtotals								0.000	0.000	32.092	0.000	32.092
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost	
• N/A: N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-	

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017	
Appropriation/Budget Activity 3600 / 5				R-1 Program Element (Number/Name) PE 0604602F / Armament/Ordnance Development				Project (Number/Name) 651033 / Sensor Fuzed Weapon			
C. Other Program Funding Summary (\$ in Millions)											
	<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u> <u>Total Cost</u>
<u>Remarks</u>											
D. Acquisition Strategy											
Develop modification to wing kit to extend the range of inventory Cluster Bomb Unit-105 (CBU-105) anti-tank area attack weapons.											
E. Performance Metrics											
Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.											

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Air Force												Date: May 2017			
Appropriation/Budget Activity 3600 / 5						R-1 Program Element (Number/Name) PE 0604602F / Armament/Ordnance Development						Project (Number/Name) 651033 / Sensor Fuzed Weapon			
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Design Development	TBD	Not specified. : TBD	-	0.000		0.000		17.330		0.000		17.330	Continuing	Continuing	-
Subtotal			-	0.000		0.000		17.330		0.000		17.330	-	-	-
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration	TBD	Not specified. : TBD	-	0.000		0.000		0.802		0.000		0.802	Continuing	Continuing	-
Subtotal			-	0.000		0.000		0.802		0.000		0.802	-	-	-
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Modeling and Simulation	TBD	Not specified. : TBD	-	0.000		0.000		13.158		0.000		13.158	Continuing	Continuing	-
Subtotal			-	0.000		0.000		13.158		0.000		13.158	-	-	-
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract Support	TBD	Not specified. : TBD	-	0.000		0.000		0.802		0.000		0.802	Continuing	Continuing	-
Subtotal			-	0.000		0.000		0.802		0.000		0.802	-	-	-
Project Cost Totals			Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
			-	0.000		0.000		32.092		0.000		32.092	-	-	-
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Air Force																							Date: May 2017																
Appropriation/Budget Activity 3600 / 5												R-1 Program Element (Number/Name) PE 0604602F / Armament/Ordnance Development												Project (Number/Name) 651033 / Sensor Fuzed Weapon															
												FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
												1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Development /Testing																																							

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Air Force			Date: May 2017
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604602F / Armament/Ordnance Development	Project (Number/Name) 651033 / Sensor Fuzed Weapon	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Development /Testing	1	2018	4	2021

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600 / 5					R-1 Program Element (Number/Name) PE 0604602F / Armament/Ordnance Development				Project (Number/Name) 653133 / Bombs & Fuzes			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
653133: Bombs & Fuzes	-	17.546	11.066	9.592	0.000	9.592	29.596	23.614	199.930	111.926	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 05 PE 0604602F, project 653133, Cockpit-Selectable Height-Of-Burst Sensor (C-HOBS), is a new start.

A. Mission Description and Budget Item Justification

The Bombs & Fuzes (Armament Subsystems) Project develops and integrates advanced precision, navigation, and timing (PNT) capabilities (i.e., GPS, non-GPS, optical, passive, active, etc.); and improves conventional weapons/munitions (kinetic and non-kinetic), fuzes, and height-of-burst sensors (HOBS). The project also provides an opportunity to quickly insert emerging technologies into existing and developing aircraft munitions and fuzes. Bombs and fuzes provides research, development and testing of conventional warhead, fuzing, and HOBS modifications to improve lethality against area, mobile, and fixed targets, to include anti-personnel anti-materiel (APAM) targets. This project provides for the development and testing necessary to provide a suitable manufacturing base of conventional warheads, fuzes, and HOBS.

Major thrust areas include:

- Munitions Materiel Handling Equipment (MMHE): MMHE is a continuing project to develop and improve the standardization and commonality of munitions handling and armament equipment to preclude duplication. Efforts are primarily the study, design, and development of MMHE and armament control systems; however, support may be provided to other functional areas as requested. Procurement will be performed and funded by the applicable weapons system project.
- Medium Caliber Ammunition project assesses, refines, and develops medium caliber ammunition, to include, but not limited to, conducting 25mm (F-35) qualification and comparative testing.
- Insensitive Munitions (IM): IM models and validates munition performance, integrates less sensitive explosive fills, addresses IM explosive fill deficiencies, and develops bomb case modifications to improve the response of conventional weapons to unplanned stimuli. Supports AF IM strategic planning to achieve IM compliance IAW U.S. Code, Title 10, Subtitle A, Part N, Chapter 141, Section 2389, ensuring safety regarding insensitive munitions.
- BLU-134/B Improved Lethality Warhead (ILW): This Next Generation Area Attack Weapon (NGAAW), formerly known as Improved Lethality (IL), continues and expands development planning and legacy warhead efforts to improve lethality against area targets, to include anti-personnel anti-materiel (APAM) targets. This effort studies, designs, develops and tests warhead and fuzing modifications which improve lethality against APAM while meeting current DoD policy on cluster munitions and unintended harm to civilians. These improvements may be synergistic with maintaining a suitable manufacturing base. This effort was a new start in Project 653133, Bombs & Fuzes, in FY15.

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Appropriation/Budget Activity 3600 / 5		R-1 Program Element (Number/Name) PE 0604602F / Armament/Ordnance Development	Project (Number/Name) 653133 / Bombs & Fuzes				
<p>- Advanced Precision Kill Weapon System (APKWS) II Rotary Wing Plus (RW+): Integrate rotary wing rocket (2.75-inch), M151 warhead (Frag) with a new BAE laser guidance system on A-10/F-16. Provide limited envelope capability within 6 months, expand envelope in 14 months, and integrate new M282 warhead (Penetrator). This effort was an approved UON in FY2016, executing FY2015 funding.</p> <p>- Cockpit-selectable Height-Of-Burst Sensor (C-HOBS): Follow-on development activities for legacy fuzes and HOBS, including reliability enhancements and producibility improvements.</p>							
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Munitions Materiel Handling Equipment (MMHE)			0.748	0.674	0.692	0.000	0.692
Description: MMHE. Armament Standardization/Control/Munitions Materiel Handling Equipment (MMHE) is a continuing project to develop and improve the standardization and commonality of munitions handling and armament equipment to preclude duplication. Efforts are primarily the study, design, and development of MMHE and armament control systems; however, support may be provided to other functional areas as requested. Procurement will be performed and funded by the applicable weapons system project.							
FY 2016 Accomplishments: Completed 18 MMHE support equipment projects to include engineering, drafting, proof load, technical data, and safety authorizations. Fabricated 12 prototypes for test and evaluation purposes. Completed 10 first article equipment fabrications for drafting verification and delivery to Air Force units for additional test and evaluation. Provided support to all system program offices with new weapons and aircraft configurations, as needed. Continued support to the F-35 program with equipment to aid safe munitions loading and handling of various pylons and adapters. Continued support and sustain all previously existing items developed by the MMHE program office. Continued to provide MMHE Sustainment office at Robins AFB with engineering support.							
FY 2017 Plans: Completed 10 MMHE support equipment projects to include engineering, drafting, proof load, technical data, and safety authorizations. Fabricated 6 prototypes for test and evaluation purposes. Completed 9 first article equipment fabrications for drafting verification and delivery to Air Force units for additional test and evaluation. Provided support to all system program offices with new weapons and aircraft configurations, as needed. Continued support to the F-35 program with equipment to aid safe munitions loading and handling of various pylons and adapters. Continued support and sustainment of all previously existing items developed by the MMHE program office. Continued to provide MMHE Sustainment office at Robins AFB with engineering support.							
FY 2018 Base Plans:							

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force				Date: May 2017		
Appropriation/Budget Activity 3600 / 5		R-1 Program Element (Number/Name) PE 0604602F / Armament/Ordnance Development		Project (Number/Name) 653133 / Bombs & Fuzes		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Complete 15 MMHE support equipment projects to include engineering, drafting, proof load, technical data, and safety authorizations. Fabricate 10 prototypes for test and evaluation purposes. Complete 15 first article equipment fabrications for drafting verification and delivery to Air Force units for additional test and evaluation. Provide support to all system program offices with new weapons and aircraft configurations, as needed. Continue support to the F-35 program with equipment to aid safe munitions loading and handling of various pylons and adapters. Provide support to the B-21 program office with evaluations and recommendations for equipment to aid safe munitions loading and handling of various pylons and adapters. Continue support and sustain all previously existing items developed by the MMHE program office. Continue to provide MMHE Sustainment office at Robins AFB with engineering support. FY 2018 OCO Plans: N/A						
Title: Medium Caliber Ammunition Description: The Medium Caliber ammunition efforts support the warfighter’s medium caliber ammunition research, development, test, and evaluation (RDT&E) requirements, DoN/USAF collaboration for the medium caliber family of ammunition, foreign comparative testing, inventory health challenges, procurement of ammunition, and other emerging technologies. FY 2016 Accomplishments: Continued to provide engineering and technical support for DT flight testing of PGU-48/B (Frangible Armor Piercing (FAP)) rounds and integration of PGU-48/B with F-35 25mm gun ammunition loader assembly. Continued/completed acquisition planning for initial production contract and acquisition of data rights. FY 2017 Plans: Continued to provide engineering and technical support for DT flight testing of PGU-48/B (Frangible Armor Piercing (FAP)) rounds and integration of PGU-48/B with F-35 25mm gun ammunition loader assembly. Completed acquisition planning for initial production contract and acquisition of data rights to include sole source award of PGU-48/B for F-35 3F IFC. Comparative testing of PGU-20X/U against results from the PGU-48/B tests to establish alternate vendor base source to enable competition in future procurements and long-term F-35 25mm ammunition. Assessed and mitigated inventory health challenges. FY 2018 Base Plans:		0.100	0.100	0.100	0.000	0.100

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Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604602F / Armament/Ordnance Development	Project (Number/Name) 653133 / Bombs & Fuzes				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continue to provide engineering and technical support for PGU-48/B rounds as well as further comparative testing/EMD of alternative products/sources. Continue to assess and mitigate Medium Caliber ammunition health inventory challenges. FY 2018 OCO Plans: N/A						
Title: Insensitive Munitions (IM) Description: Model and validate munition performance; assess and correct identified IM explosive fill deficiencies; conduct strategic IM planning for the AF; support Joint Service IM efforts; provide technical guidance and test expertise to AF IM programs. FY 2016 Accomplishments: Delivered the FY17/18 AF IM Strategic Plan; support DoD and Joint Service IM planning; provide IM planning expertise to individual AF programs. FY 2017 Plans: Initiated the FY19/20 AF IM; model and validate munition performance; support DoD and Joint Service IM planning; provide IM planning expertise to individual AF programs. FY 2018 Base Plans: Initiate the FY21/22 AF IM; model and validate munition performance; support DoD and Joint Service IM planning; provide IM planning expertise to individual AF programs and continue to improve, characterize, and integrate less sensitive explosive fills, assess and correct identified IM explosive fill deficiencies, and develop bomb case modifications to improve the response of conventional weapons to unplanned stimuli. FY 2018 OCO Plans: N/A		0.350	0.300	0.300	0.000	0.300
Title: BLU-134/B Improved Lethality Warhead (ILW) Description: BLU-134/B Improved Lethality Warhead (ILW), formerly known as Improved Lethality (IL), seeks to improve lethality against area targets, to include anti-personnel anti-materiel (APAM) targets. Improvements must meet current DoD policy on cluster munitions and unintended harm to civilians and may be synergistic with maintaining a suitable manufacturing base while also providing possible solutions for other Next Generation Area Attack Weapons (NGAAW).		15.648	9.492	0.000	0.000	0.000

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Appropriation/Budget Activity 3600 / 5		R-1 Program Element (Number/Name) PE 0604602F / Armament/Ordnance Development	Project (Number/Name) 653133 / Bombs & Fuzes				
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>FY 2016 Accomplishments: Completed BLU-134/B Improved Lethality Warhead (ILW) source selection for an area attack employed, near-term, 500lb warhead for improved APAM target lethality which meets DoD policy. Two (2) contracts were awarded for pilot production with potential for four (4) production options with max qty 15K/option and Best Estimated Quantity (BEQ) 10K/option. The contractors continue to prove out their manufacturing processes with each producing thirty (30) MK 82 Mod 7 empty Cast Ductile Iron (CDI) bomb body assemblies in accordance with the Government owned Technical Data Package (TDP). Continued to develop other Next Generation Area Attack Weapon (NGAAW) solutions to meet DoD UXO Policy including Next Generation Area Attack Weapon Increment II (NGAAW II) with a reserved designation as the BLU-136/B.</p> <p>FY 2017 Plans: Continued manufacturing development of BLU-134/B ILW. Began Government testing (DT/OT) of the BLU-134/B ILW. Continued to develop NGAAW II, designated the BLU-136/B, as an enhanced solution to meet DoD UXO Policy. Plans included: mature the warhead designs, build and test prototypes, and develop the Technical Data Packages for high fragmentation warheads.</p> <p>FY 2018 Base Plans: Continue Government RDT&E of BLU-134/B ILW. Continue warhead design TMRR, EMD, and qualification of Next Generation Area Attack Weapon Increment II, in preparation for production. Continue planning for NGAAW pre-planned product improvements (P3I).</p> <p>FY 2018 OCO Plans: N/A</p>							
<p>Title: Cockpit-Selectable Height-Of-Burst Sensor (C-HOBS)</p> <p>Description: Cockpit-Selectable Height-Of-Burst Sensor (C-HOBS): Cockpit selectable sensor capability to support legacy and Next Generation Area Attack weapons, to include the BLU-134/136. Eliminates single factory setting; allows flexibility during flight to address a wide array of targets. Effort includes follow-on studies, risk reduction, and product improvement initiatives to integrate cockpit selectability and other flexible effects features with threshold and objective aircraft and weapons platforms.</p> <p>FY 2016 Accomplishments: N/A</p> <p>FY 2017 Plans:</p>			0.000	0.000	8.500	0.000	8.500

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A						
FY 2018 Base Plans: Support Cockpit selectable sensor capability to legacy and Next Generation Area Attack weapons, to include the BLU-134/136. Eliminates single factory setting; allows flexibility during flight to address a wide array of targets. Effort includes follow-on studies, risk reduction, and product improvement initiatives to integrate cockpit selectability and other flexible effects features with threshold and objective aircraft and weapons platforms. Contract award projected 3QFY18. Planned completion of all activities leading up to and including Systems Requirements Review (SRR), followed by 80% of preparatory actions required to execute Preliminary Design Review (PDR) in 1QFY19.						
FY 2018 OCO Plans: N/A						
Title: Advanced Precision Kill Weapon System II Rotary Wing Plus (APKWS II RW+) Description: Integrate rotary wing rocket (2.75-inch), M151 warhead (Frag) with a new BAE laser guidance system on A-10/F-16. Provide limited envelope capability within 6 months, expand envelope in 14 months, and integrate new M282 warhead (Penetrator).		0.700	0.500	0.000	0.000	0.000
FY 2016 Accomplishments: Completed AGR-20A (M151 warhead) weapons integration and fielding activities on the A-10/F-16 aircraft. Began integration efforts of the AGR-20B (M282 Warhead), to include centrifuge testing, captive flight profiles, initial DT testing, ground testing and instrumented measurement vehicle flights.						
FY 2017 Plans: Continued integration efforts on the M282 to include vibration, DT, lethality, OT, and Weapons Effects testing. Developed the Rules of Thumb and employment TTP’s on the A-10/F-16. Fielded the AGR-20B rocket on the A-10/F-16.						
FY 2018 Base Plans: Complete any remaining OT and weapon effects testing for M282 fielding recommendation.						
FY 2018 OCO Plans: N/A						
Accomplishments/Planned Programs Subtotals		17.546	11.066	9.592	0.000	9.592

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Appropriation/Budget Activity 3600 / 5				R-1 Program Element (Number/Name) PE 0604602F / Armament/Ordnance Development				Project (Number/Name) 653133 / Bombs & Fuzes			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• PAAF: BA01: Line Item #	0.000	80.000	81.573	0.000	81.573	85.000	87.000	0.000	0.000	0.000	0.000
353020: General Purpose Bombs											
• PAAF: BA01: Line Item #356120: Fuzes	0.000	0.000	0.000	0.000	0.000	0.000	20.400	31.400	29.300	0.00	81.100
• PAAF: BA01:Line Item #352010: Cartridges	0.000	10.000	4.000	0.000	4.000	4.000	8.000	8.000	8.000	0.00	10.000
Remarks											
D. Acquisition Strategy											
- Fuzes (including the FMU-152) is a continuing effort with most activities performed in-house or through contracted services (small contracts).											
- Munitions Materiel Handling Equipment (MMHE) project activities are performed in-house with limited technical and analysis contract support.											
- Medium Caliber ammunition project activities are performed in-house with technical and analysis contract support, organic government test support, and possible contracted services (small contracts).											
- Insensitive Munitions project activities are performed in-house with limited technical and analysis contract support.											
- The BLU-134/B ILW qualification program will provide a materiel solution and possible modification packages that would precede efforts to achieve a full qualification and low-rate initial production (LRIP).											
- Other NGAAW solutions will implement an accelerated acquisition program strategy. The strategy includes concurrent TMRR and development of warhead designs, building and testing prototypes, to develop technical data packages (TDPs) for low-rate initial production (LRIP), while continuing NGAAW pre-planned product improvements (P3I).											
- APKWS II RW+ will leverage M151 testing and activities to advance the fielding of the M282 warhead. The Department of Navy (DoN) has a production contract with BAE Systems, Inc. to produce APKWS II RW+ units for rotary wing aircraft. The proposed solution is to procure APKWS II hardware with Fixed Wing software (RW+) and integrate onto the A-10 and F-16 aircraft.											
E. Performance Metrics											
Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.											

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600 / 5					R-1 Program Element (Number/Name) PE 0604602F / Armament/Ordnance Development				Project (Number/Name) 653134 / BLU-109 and BLU-113 Upgrade			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
653134: BLU-109 and BLU-113 Upgrade	-	13.412	4.496	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	17.908
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Advanced BLU-109 project develops and integrates advanced precision, navigation, and timing (PNT) capabilities (i.e., GPS, non-GPS, optical, passive, active, etc.); and demonstrates advancements in capability of the legacy penetrator warhead, enabling it to hold more targets at risk than currently achievable with the legacy weapon. The initial effort will focus on demonstrating an Advanced 2000 lb (A2K) warhead in a relevant military environment. Advanced 2000 lb (A2K) has been designated the BLU-137/B. The follow-on effort will provide production assets as a replacement warhead for the BLU-109 C/B warhead.

BLU-113 D/B incorporates BLU-137/B based design modifications to improve BLU-113 performance.

The Advanced 5000 lb Penetrator (A5K) risk reduction efforts started in the PE 0604602F/Armament/Ordnance Development 653134/BLU-109 and BLU-113 Upgrade but funding for the A5K development effort will transition to PE 0604327F/Hard and Deeply Buried Target Defeat System (HDBTDS)Program 645341/Direct Strike Penetrator Systems beginning FY18.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Advanced 2000 lb (A2K) Penetrator and Advanced 5000 lb (A5K) Penetrator Programs	13.412	4.496	0.000	0.000	0.000
Description: Conduct A2K and A5K design analysis, warhead modifications, and testing to improve BLU-109/113 performance against increasingly hardened targets. A2K will maintain the current BLU-109 mold lines and will attempt to maintain current BLU-109 mass properties and Insensitive Munitions (IM) characteristics. Finalize new technical drawing package and manufacturing readiness for A2K warhead and replace BLU-109 C/B warhead production with A2K warhead.					
FY 2016 Accomplishments: Completed manufacturing and technical data package as well as conduct risk reduction and qualification testing of A2K design to include modified FZUs and cables, modified JDAM hardbacks, and modified warhead cases employed on the threshold platforms (B-2A & F-15E). Fully qualify A2K warhead design for Production readiness. Continued developing A5K initial design, risk reduction and modeling and simulation.					
FY 2017 Plans:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force				Date: May 2017	
Appropriation/Budget Activity 3600 / 5		R-1 Program Element (Number/Name) PE 0604602F / <i>Armament/Ordnance Development</i>		Project (Number/Name) 653134 / <i>BLU-109 and BLU-113 Upgrade</i>	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Finalized qualification testing of A2K design to include modified FZUs and cables, modified JDAM hardbacks, and modified warhead cases employed on the threshold platforms (B-2A & F-15E). Also, completed qualification of the A2K warhead design for Production readiness. Continued developing A5K initial design, risk reduction, qualification and testing.</p> <p><i>FY 2018 Base Plans:</i> N/A</p> <p><i>FY 2018 OCO Plans:</i> N/A</p>					
Accomplishments/Planned Programs Subtotals	13.412	4.496	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• PAAF:BA01 BPAC:	0.000	35.000	35.000	0.000	35.000	35.000	35.000	75.000	75.000	Continuing	Continuing
353020: <i>GP Bombs</i>											
• RDTE: BA04: PE	0.000	0.000	17.365	0.000	17.365	72.039	0.000	0.000	0.000	0.00	89.404
0604327F: <i>HDBTDS</i>											
<u>Remarks</u> N/A											
<u>D. Acquisition Strategy</u> The A2K/A5K project will provide a BLU-109/BLU-113 modification package to enable a fielding recommendation.											
<u>E. Performance Metrics</u> Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.											

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force										Date: May 2017		
Appropriation/Budget Activity 3600 / 5					R-1 Program Element (Number/Name) PE 0604602F / Armament/Ordnance Development				Project (Number/Name) 655361 / Stores-Aircraft Interface			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
655361: Stores-Aircraft Interface	-	5.308	4.750	4.856	0.000	4.856	4.935	5.026	5.113	5.218	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Stores-Aircraft Interface: This project conducts stores-aircraft interface upgrades and standards development to include the Universal Armament Interface (UAI) and Universal Navigation Interface (UNI). UAI and UNI are Air Force initiatives to develop standardized software interfaces in aircraft weapons and Mission Planning. UAI standardizes software interfaces to support integration of weapons independent of aircraft Operational Flight Programs (OFP) cycles. UAI is currently being implemented on the F-15E, F-16 Block 40/50 and EPAF(European Participating Air Forces) F-16 aircraft, Small Diameter Bomb (SDB) I and II, Joint Direct Attack Munition (JDAM), Laser JDAM, Joint Air-to-Surface Stand-off Missile (JASSM) and Precision Guided Munitions Planning Software (PGMPS). Additional aircraft and weapons, including but not limited to, Joint Strike Fighter (JSF/F-35), B-1, B-52, LRS-B, MQ-9, JASSM-ER, CWDS as well as Army and Navy UAVs and Navy F/A-18s, have program plans to implement UAI. UNI standardizes software interfaces between the Embedded Global Positioning/Inertial Navigation System (EGI/INS) and the aircraft and weapons. The UAI program office is responsible for development and enhancement of the standard (U.S. and allied), support to coalition/allied/joint interoperability efforts for weapons-platform interface efforts, provision of certification tools and implementation support to aircraft and weapons.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: UAI and UNI Development								5.308	4.750	4.856	0.000	4.856
Description: Conduct stores-aircraft interface upgrades and standards development to the Universal Armament Interface (UAI) and Universal Navigation Interface (UNI) development of and maintenance to the UAI and UNI, and facilitation of aircraft, stores and mission planning program users in the UAI and UNI process.												
FY 2016 Accomplishments: Continued with development and configuration management of UAI standards in response to new users including but not limited to F-35, JASSM-ER, CWDS, F/A-18 and Army & Navy UAVs and stores. Supported working group management, technical meetings and workshops, risk reduction studies, common mission planning, and supported platform specific implementation of UAI. Continued maintenance of existing certification tools and procured new certification tools with miniature and micro munitions interface capability to meet F-35, B-1, B-52, SDB II, F/A-18, and other future user system integration lab test certification needs. These tools are shared among aircraft and weapons programs to reduce time and cost for UAI integration efforts. Continued negotiation implementation for multinational Memorandum of Understanding to broaden the use by coalition partners.												
FY 2017 Plans:												

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force				Date: May 2017							
Appropriation/Budget Activity 3600 / 5		R-1 Program Element (Number/Name) PE 0604602F / <i>Armament/Ordnance Development</i>		Project (Number/Name) 655361 / <i>Stores-Aircraft Interface</i>							
B. Accomplishments/Planned Programs (\$ in Millions)											
		FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total					
<p>Continue development and configuration management of UAI standards in response to new users including but not limited to F-35, JASSM-ER, CWDS, F/A-18 and Army & Navy UAVs and stores. Support working group management, technical meetings and workshops, risk reduction studies, common mission planning, and support platform specific implementation of UAI. Continue development of new certification tools with miniature and micro munitions interface capability to meet F-35, SDB II, F/A-18, and other future user system integration lab test certification needs. These tools are shared among aircraft and weapons programs to reduce time and cost for UAI integration efforts. Continue negotiation for multinational Memorandum of Understanding to broaden the use by coalition partners. Develop a baseline UNI ICD defining a standardized interface between the EGI-M box and the aircraft.</p> <p><i>FY 2018 Base Plans:</i> Continue development and configuration management of UAI standards in response to new users including but not limited to F-35, JASSM-ER, CWDS, F/A-18 and Army & Navy UAVs and stores. Support working group management, technical meetings and workshops, risk reduction studies, common mission planning, and support platform specific implementation of UAI. Continue maintenance of existing certification tools to meet F-35, SDB II, F/A-18, and other future user system integration lab test certification needs. These tools are shared among aircraft and weapons programs to reduce time and cost for UAI integration efforts. Supporting multinational Memorandum of Understanding including but not limited to Joint Strike Missile (JSM), SPEAR 3 and Stand Off Missile - Joint (SOM-J). Continue UNI development of the ICD.</p> <p><i>FY 2018 OCO Plans:</i> N/A</p>											
Accomplishments/Planned Programs Subtotals		5.308	4.750	4.856	0.000	4.856					
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• RDTE BA04 PE 0604201F BPAC:641029: <i>Acft Interface</i>	0.000	0.000	5.014	0.000	5.014	0.000	0.000	0.000	0.000	0.00	5.014
Remarks N/A											

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Air Force		Date: May 2017
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604602F / <i>Armament/Ordnance Development</i>	Project (Number/Name) 655361 / <i>Stores-Aircraft Interface</i>
<p><u>D. Acquisition Strategy</u></p> <p>In December 2004, under the authority of a class Justification and Approval (J&A), the UAI program office awarded individual Cost Plus Fixed Fee (CPFF) contracts to Boeing, Lockheed Martin, Northrop Grumman and Raytheon. Each Original Equipment Manufacturer is responsible for a different piece of the total UAI requirement based on its product-specific (platform/weapon) expertise. During FY10 these contracts expired. Under the authority of the class J&A, Cost Plus Incentive Fee (CPIF) contracts were awarded to the four UAI vendors in August 2010. Follow-on period of performance was awarded in March 2014 for 16 months to better align future contract awards with funding through the Future Years Defense Program. The current period of performance was extended to 1 November 2015 to allow immediate start of the effort on F-35/JSF request for changes. A new J&A was approved in January 2015 for the follow-on sole source contracts to the original equipment manufacturers. These new sole-source contracts awarded November 2015.</p> <p><u>E. Performance Metrics</u></p> <p>Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.</p>		